AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A frequency converter for converting a frequency of an input signal to an arbitrary frequency, comprising:

Ma polyphase ~~structure~~ filters for multiplying each of N coefficients ~~M polyphase filters each having N=L/M coefficients (where L and M are both positive integers) determined by dividing L coefficients by M,~~ by M signals determined by sampling signals for a period K of a sine wave having a period M/K for one sampling period, on a one-to-one basis, each of the M polyphase filters having N=L/M coefficients (where L and M are both positive integers) determined by dividing L coefficients by M; and

a sampling frequency converter with a conversion ratio M, the sampling frequency converter being coupled to the M polyphase filters.

2. (Currently Amended) A~~The~~ frequency converter for converting a frequency of an input signal to an arbitrary frequency, ~~as set forth in claim 1, further~~ comprising:

M1a polyphase ~~structure~~ filters ~~or a sampling frequency converter~~ with a conversion ratio M1, for multiplying ~~M1 polyphase filters~~each of N coefficients by M1 signals determined by sampling signals for a period K of a sine wave having a period M1/K for one sampling period, on a one-to-one basis, each of the M1 polyphase filters having N=L/M coefficients (where L and M are both positive integers) determined by dividing L coefficients by M; ~~and~~

a sampling frequency converter with a conversion ratio M1, the sampling

frequency converter being coupled to the M1 polyphase filters;

~~a~~M2 polyphase ~~structure~~ filters ~~or a sampling frequency converter~~ with a conversion ratio M2, for multiplying ~~M2=M-M1 polyphase filters~~each of the N coefficients by M2 signals determined by sampling signals for a period K of a sine wave having a period M2/K for one sampling period, on a one-to-one basis, the M2 polyphase filters having M2=M-M1; and

a sampling frequency converter with a conversion ratio M2, the sampling frequency converter being coupled to the M2 polyphase filters.

3. (Currently Amended) A~~The~~ frequency converter for converting a frequency of an input signal to an arbitrary frequency, ~~as set forth in claim 1, further~~ comprising:

~~an I-fold interpolator (where I is a positive integer) arranged in a stage following the polyphase structure filter;~~

(M×I) ~~wherein the~~ polyphase structure filters for multiplying~~es~~ each of P coefficients ~~(M×I) polyphase filters each having P=L/(M×I) coefficients determined by dividing L coefficients by (M×I),~~ by (M×I) signals determined by sampling signals for a period K of a sine wave having a period (M×I)/K for one sampling period, on a one-to-one basis (where I is a positive integer), the (M×I) polyphase filters each having P=L/(M×I) coefficients determined by dividing L coefficients by (M×I);

an I-fold interpolator arranged in a stage following the (M×I) polyphase filters; and

a ~~wherein the~~ sampling frequency converter for performings 1/(M×I)-fold

interpolation, the sampling frequency converter being coupled to the (M×I) polyphase filters.

4. (Currently Amended) A~~The~~ frequency converter for converting a frequency of an input signal to an arbitrary frequency, ~~as set forth in claim 1, further~~ comprising:

~~a 1/D-fold decimator (where D is a positive integer) arranged in a stage preceding the polyphase structure filter;~~

M×D ~~wherein the~~ polyphase ~~structure~~ filters for multiplying ~~ies (M×D) polyphase filters~~ each of ~~having~~ Q ~~=L/(M×D)~~ coefficients determined by dividing L coefficients by (M×D), by (M×D) signals determined by sampling signals for a period K of a sine wave having a period (M×D)/K for one sampling period, on a one-to-one basis (where D is a positive integer), the (M×D) polyphase filters each having Q=L/(M×D) coefficients determined by dividing the L coefficients by (M×D);

a 1/D-fold decimator arranged in a stage preceding the (M×D) polyphase filters; and

a ~~wherein the~~ sampling frequency converter for performings (M×D)-fold interpolation, the sampling frequency converter being coupled to the (M×D) polyphase filters.

5. (Currently Amended) A frequency converter for converting a frequency of an input signal to an arbitrary frequency, comprising:

M~~a~~ polyphase ~~structure~~ filters for multiplying a code~~M polyphase filters each~~

~~having as one coefficient a code calculated by dividing M codes (where M is a positive integer) by M,~~ by M signals determined by sampling signals for a period K of a sine wave having a period M/K for one sampling period, on a one-to-one basis, each of the M polyphase filters having as one coefficient the code calculated by dividing M codes (where M is a positive integer and M codes refers to M coefficient codes) by M; and

a sampling frequency converter with a conversion ratio M, the sampling frequency converter being coupled to the M polyphase filters;

wherein the input signal is correlated with the code.

6. (Currently Amended) A frequency converter for converting a frequency of an input signal to an arbitrary frequency, the frequency converter including ~~a polyphase structure filter having~~ M polyphase filters with N=L/M coefficients determined by dividing L coefficients by M (where L and M are both positive integers), the frequency converter, comprising:

the M polyphase filters each including;

coefficient banks having P kinds (where P is a positive integer larger than 2) of filter coefficient sequences;

wherein the M polyphase filters consecutively select filter coefficient sequences one-by-one among the P kinds of coefficient banks~~a coefficient bank for switching one bank each time M input discrete time sequences are received,~~ and setting~~assigning P kinds (where P is a positive integer larger than 2) of~~ the selected filter coefficient sequences ~~to~~as multipliers of the M polyphase filters ~~one by one~~;

wherein an M^{th} polyphase filter among the M polyphase filters~~the coefficient bank of an M^{th} polyphase filter~~ provides P kinds of coefficient sequences ~~for the M^{th} polyphase filter~~ among P kinds of a total of M phase coefficients calculated by multiplying coefficients determined by repeating M original phase coefficient sequences of the polyphase filter P times in a phase direction by P×M signals determined by sampling signals for a period K of a sine wave having a period P×M/K for one sampling period, on a one-to-one basis.